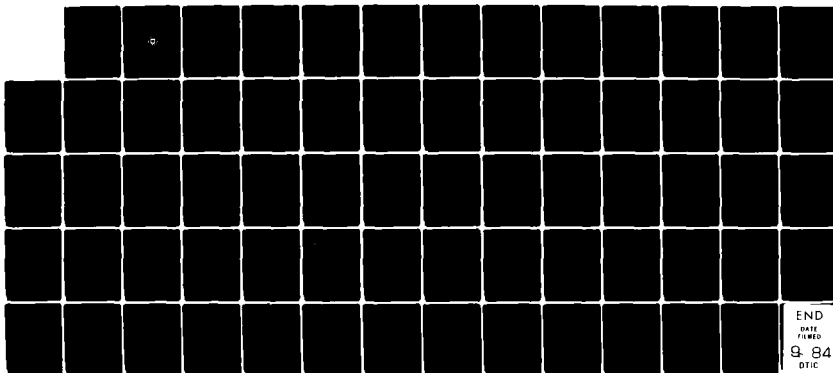
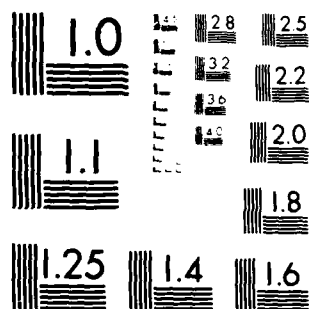


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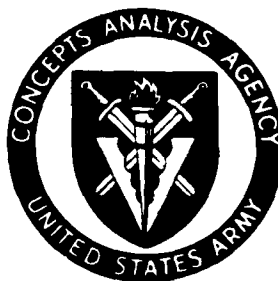
STUDY REPORT
CAA-SR-84-17

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**EFFECTIVE DATE (E-DATE) MODEL ENHANCEMENT
(EME)**

AD-A144 496

AUGUST 1984



**PREPARED BY
FORCE SYSTEMS DIRECTORATE**

**US ARMY CONCEPTS ANALYSIS AGENCY
8120 WOODMONT AVENUE
BETHESDA, MARYLAND 20814**

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Five enhancements were incorporated into the E-DATE Model to improve its cap- ability to assist the ODCSLOG in evaluating the adequacy of the (TAEDP-gener- ated) equipment fill of Army units. The enhancements provided for: a model capability to: a. Create new (unprogramed) units, and fill them with assets from currently programed units, <i>→ cwi</i>		

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20. (continued)

- b. Include substitute items of equipment in the rating of assets in units and the redistribution of assets among units.
- c. Adjust the model storage to handle an effectively unlimited number of units.
- d. Process units identified as conversions in the TAEDP data.
- e. Develop a user friendly program to assist the user in the operation and control of the model. ^

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STUDY REPORT
CAA-SR-84-17

EFFECTIVE DATE (E-DATE) MODEL ENHANCEMENT (EME)

AUGUST 1984

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US ARMY CONCEPTS ANALYSIS AGENCY
8120 WOODMONT AVENUE
BETHESDA, MARYLAND 20814**



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DEPARTMENT OF THE ARMY
US ARMY CONCEPTS ANALYSIS AGENCY
8120 WOODMONT AVENUE
BETHESDA, MARYLAND 20814

REPLY TO
ATTENTION OF:

CSCA-FSL

0 3 AUG 1984

SUBJECT: E-Date Model Enhancement (EME) Study

Deputy Chief of Staff for Logistics
Department of the Army
ATTN: DALO-PLF
Washington, D.C. 20310-1718

1. Reference:

a. Letter, DALO-PLF, 9 September 1983, subject: Equipment Readiness Analysis (ERA) Study (subsequently renamed the E-DATE Model Enhancement (EME) Study).


b. Letter, DALO-PLF, 7 June 1984, subject: Effective Date (E-DATE) Model Enhancement Amendment.

2. Reference 1a directed that the US Army Concepts Analysis Agency (CAA) incorporate four enhancements into the model (E-DATE Model) developed earlier during the MTO-DATES Study. One enhancement permits the model, under user control, to create new (unprogramed) units using existing units as prototypes and to fill these units with assets transferred from currently programed units. A second enhancement permits the model to identify and include substitute items of equipment in the rating and redistribution of assets. A third enhancement removes the restriction on the number of units processed for a given fiscal year. A fourth enhancement provides a user friendly interface for the model. Reference 1b directed an additional enhancement be added to the model to permit processing of the units shown as conversions in the model's data source.

3. The attached report (five copies) describes the overall study methodology and the methodology associated with each enhancement. In addition, descriptions of each enhancement have been prepared to update the existing model documentation. These descriptions are being provided directly to the Logistics Evaluation Agency, along with a tape of the enhanced E-DATE Model.

1 Incl
as

David C. Hardison
DAVID C. HARDISON
Director

	EFFECTIVE DATE (E-DATE) MODEL ENHANCEMENT (EME)	ONE SHEET STUDY GIST CAA-SR-84-17
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THE PRINCIPAL FINDINGS are that the enhanced E-DATE Model now has the capability to:

- (1) Introduce unprogramed units into the force, in the fiscal year (FY) desired.
- (2) Include equipment substitutions identified by the Total Army Equipment Distribution Program (TAEDP) in the computation of unit readiness.
- (3) Process units with no effective limit on the number involved.
- (4) Process units programed for conversion.
- (5) Interface readily with the user.

THE MAIN ASSUMPTIONS were that the TAEDP can be used as a source of table of organization and equipment (TOE) data for the unprogramed units. That is, that the TOEs are present in the data and that the required quantities of each item of equipment are complete and accurate.

THE PRINCIPAL LIMITATIONS are:

- (1) Prototype units are extracted as they are found in TAEDP with no provision for additions, deletions, or adjustment of the TOE values.
- (2) The number of substitute items of equipment associated with an authorized item is limited to the first two encountered. Any additional substitutes which may be present are not processed.

THE SCOPE OF THE STUDY was limited to the five specifically identified enhancements.

THE STUDY OBJECTIVES were:

- (1) Develop an unprogramed unit enhancement.
- (2) Develop an equipment substitution enhancement.

(3) Eliminate the current 400-unit limitation on the number of units which can be rated in a fiscal year.

(4) Process units shown as conversions in TAEDP data.

(5) Develop a user-friendly computer utility program to facilitate use of the model.

THE BASIC APPROACH was tailored to the needs of each enhancement. The unprogramed units enhancement required additional logic to extract the data from the TAEDP tape per the user specifications. The equipment substitution required additional logic to group the LIN and its substitutes into a LIN-SET and to then process this LIN-SET through rating and redistribution. The 400-unit limitation required logic to pass the rating data to mass storage and later retrieve it for display purposes.

THE REASONS FOR PERFORMING THE STUDY were to extend the E-DATE Model capability into areas of interest identified during the original and early operation of the model.

THE STUDY SPONSOR was the Director, Plans and Operations, Office of the Deputy Chief of Staff for Logistics (ODCSLOG).

THE STUDY EFFORT was directed by Mr. James J. Connelly, Force Systems Directorate.

COMMENTS AND QUESTIONS may be directed to US Army Concepts Analysis Agency, ATTN: Assistant Director for Force Systems (CSCA-FS), 8120 Woodmont Avenue, Bethesda, Maryland 20814-2797.

Tear-out copies of this synopsis are provided at back cover.

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EFFECTIVE DATE (E-DATE) MODEL ENHANCEMENT
(EME)

SECTION I - STUDY ORIGIN AND TASKING

INTRODUCTION

The Effective Date (E-DATE) Model Enhancement (EME) Study was conducted for the Director of Plans and Operations, Office of the Deputy Chief of Staff for Logistics (ODCSLOG). The study provides enhancements to the basic Effective Date (E-DATE) Model, developed in an earlier study for ODCSLOG, on the Management of MTOE Effective Dates Based on Equipment Availability (MTO Dates).²⁻⁶ As developed on the MTO Dates Study, the E-DATE Model improved the ability of the ODCSLOG to predict reliable effective dates for two groups of units--activated units and units impacted by changes generated by the Consolidated Table of Organization Update (CTU).

The enhanced model extends this assessment capability to two additional groups of units, namely unprogramed units, that is, units proposed but not as yet introduced into the force and units programmed for conversion. Provision is also made to access any group of units identified by the user. In addition, the study provides several enhancements to improve the internal design and user interaction with the model.

The principal product of the EME Study was a copy of the enhanced E-DATE Model, delivered to the Logistics Evaluation Agency (LEA), New Cumberland, PA. As with the earlier version of the model, the operation of the current version would be made via a remote terminal in the ODCSLOG working area in the Pentagon. Accompanying the model to LEA were updates to the four-volume set of model documentation originally delivered as part of the MTO Dates Study.

The following pages describe the model enhancement effort by the EME Study. On each page is a briefing slide, accompanied by annotations which elaborate on the points made in the slide.



STUDY PURPOSE

TO PROVIDE ODCSLOG WITH CAPABILITY TO ASSESS THE LOGISTICS
IMPACT OF ADDING NEW (UNPROGRAMED) UNITS TO THE FORCE.

SUPPLEMENTS CURRENT CAPABILITY OF E-DATE MODEL
TO ASSESS LOGISTICS IMPACT OF UNIT ACTIVATIONS
AND UNIT CHANGES.

1

STUDY PURPOSE

The DCSLOG is required by AR 310-49 and CSR 310-44 to advise the Deputy Chief of Staff for Operations and Plans (DCSOPS) on the supportability of unit activations and MTOE changes based on the availability of equipment assets. The previously developed E-DATE Model provided direct support for this responsibility. This was accomplished by computing a measure of logistic impact for each unit in the form of a unit C-rating. This rating assesses a unit's readiness in terms of its equipment fill. The greater the fill against the required fill, as measured by the C-rating, the greater the readiness (from the logistics standpoint).

The enhanced model extends this support to the consideration of unprogrammed units, i.e., units proposed but not as yet introduced into the force and units programmed for conversion. In addition, the study makes several improvements to the model design including the user friendliness of the model.



BACKGROUND

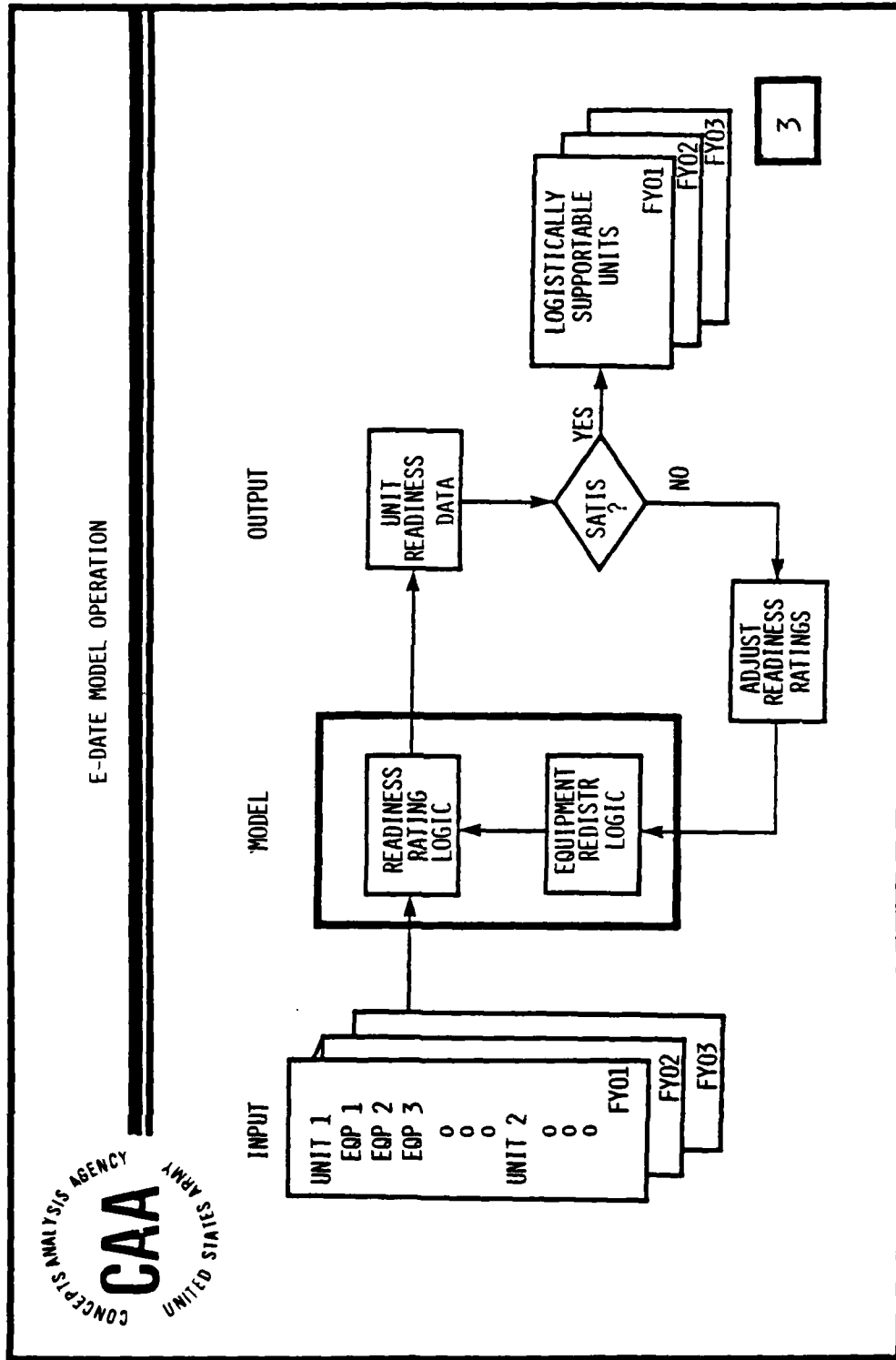
- ODCSLOG NEEDED AN IMPROVED METHOD TO ASSESS THE ARMY'S CAPABILITY TO MEET EQUIPMENT REQUIREMENTS FOR UNIT ACTIVATIONS AND MTOE CHANGES.
- EFFECTIVE DATE (E-DATE) MODEL DEVELOPED BY CAA.
- E-DATE MODEL REMOTELY OPERATED AT LEA FROM ODCSLOG.
- TOTAL ARMY EQUIPMENT DISTRIBUTION PROGRAM (TAEDP) USED BY ODCSLOG FOR EQUIPMENT ALLOCATION.

BACKGROUND

The EME Study has its origin in the predecessor MT0 Dates Study.² The MT0 Dates Study looked into the existing ODCSLOG method of assessment and determined that an automated counterpart of the process was needed. The existing process of a subjective estimate of the unit fill of critical items would be replaced by a precise calculation. In addition, the calculations would be carried out not only for the budget fiscal year, but for all 7 years of the planning period.

The MT0 Dates Study developed the methodology for the E-DATE Model, programmed the model, and installed it on a host computer at LEA. The host machine was accessible to ODCSLOG via a secure line to a terminal facility in the ODCSLOG working area in the Pentagon.

The ODCSLOG directed that the data used in the calculations would be the same as that used in the manual process, namely, the Total Army Equipment Distribution Program.⁷ This program is operated by the Depot System Command (DESCOM) at Chambersburg, Pennsylvania and is periodically run to allocate equipment to Army units on a worldwide basis.



E-DATE MODEL OPERATION

The input to the E-DATE Model is in the form of TAEDP equipment requirements and assets for each unit of interest over the 7-year planning period. The model rates the units in accordance with the unit status reporting requirements of AR 220-1.1. The resulting C-ratings are summarized as unit readiness data for evaluation by a logistics staff officer.

The user of the model has the option of adjusting the unit ratings by increasing the rating of some units at the expense of decreasing the rating of others. This adjustment of the rating is input to the E-DATE Model, which transfers the assets among the units and then recomputes the ratings to determine the ratings actually achieved. The process may be repeated as desired by the user until the units of interest have achieved the desired ratings or a decision is made to accept the levels achieved.

With this information available, a recommendation on the logistically supportable units can be generated by the ODCSLOG and passed to the DCSOPS.



STUDY OBJECTIVES

1. DEVELOP UNPROGRAMED UNIT ACTIVATION ENHANCEMENT AND INSTALL AT LEA.
2. DEVELOP EQUIPMENT SUBSTITUTION ENHANCEMENT AND INSTALL AT LEA.
3. ELIMINATE CURRENT 400-UNIT LIMITATION IN THE E-DATE MODEL.
4. PROCESS UNITS PROGRAMED FOR CONVERSION.
5. DEVELOP "USER-FRIENDLY" COMPUTER UTILITY PROGRAM FOR ODCSLOG USE.

STUDY OBJECTIVES

The objectives of the EME Study include the enhancements indicated on the slide to improve the capability and utilization of the E-DATE Model. The enhancements are as follows.

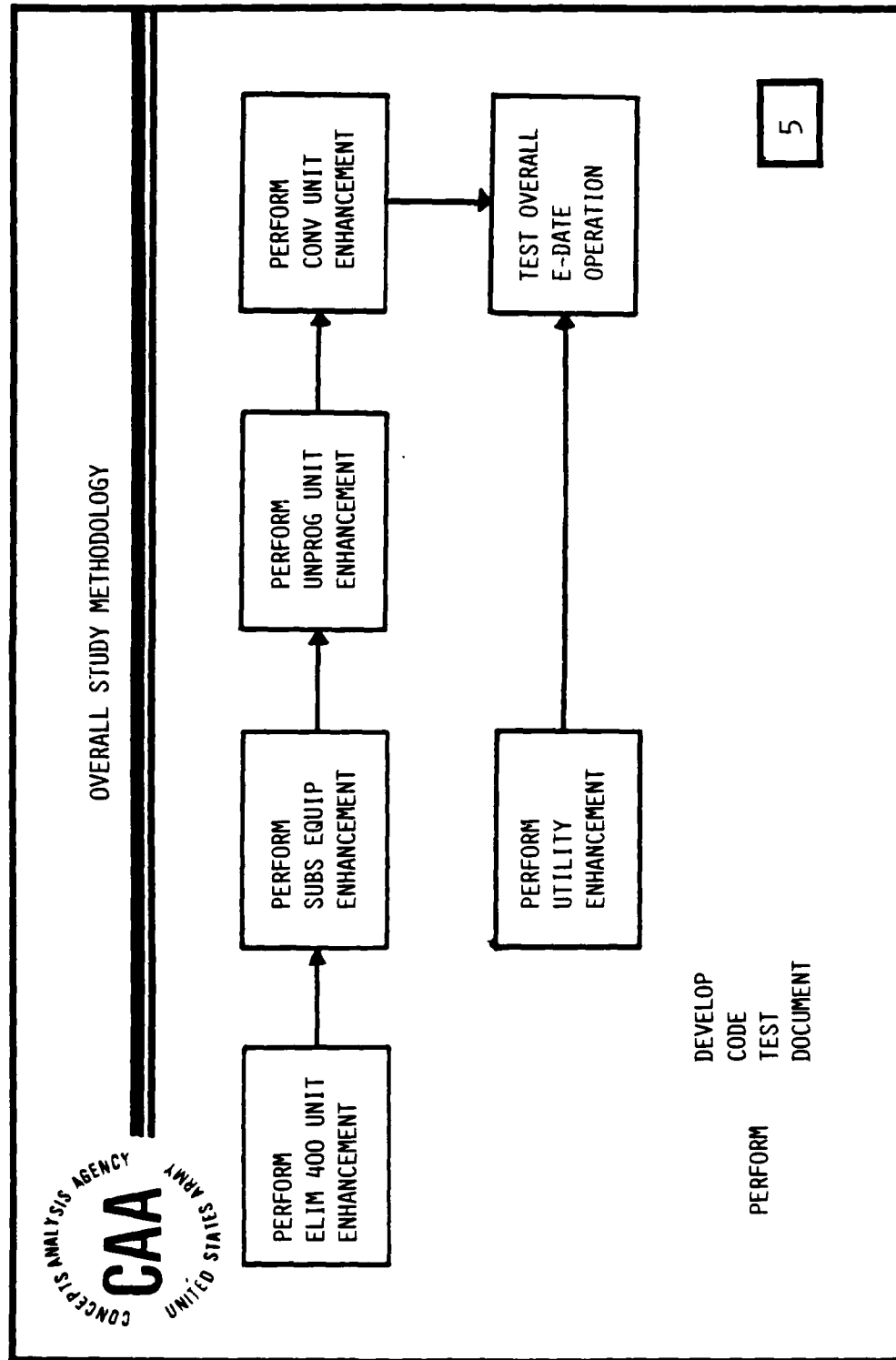
1. The unprogramed unit enhancement permits the model user to create new units by specifying a prototype unit which will then be copied to create as many new units of that type as desired. Provision is made for the user to associate a priority sequence number from the Department of the Army Master Priority List (DAMPL) and activation year (E-DATE) for the units thus created. These new units are created without any equipment. To provide the equipment, the user must indicate those units currently in the force from which equipment may be drawn to provide the fill for the new units.
2. The equipment substitution enhancement allows the model to recognize that one item of equipment is a substitute for another and to include the assets of the substitute in the assets credited toward the equipment fill of the unit.
3. The 400-unit limitation refers to the maximum number of units whose readiness C-rating can be assessed in a single fiscal year. The model code will be revised to eliminate this constraint, so that an essentially unlimited number of units can be processed.
4. The processing of unit conversions allows the model to select and process units so identified in the TAEDP data.
5. The operation of the earlier E-DATE Model required a moderate level of user familiarity with the executive control language and use of the edit utility. The user-friendly utility presents the user with computer-generated screens of instructions and choices, which will minimize the need for such user computer expertise.

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SECTION II - STUDY METHODOLOGY

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OVERALL STUDY METHODOLOGY

The EME Study was conducted as five separate efforts, each concerned with an individual enhancement. Four of the enhancements were conducted sequentially, building the current enhancement into the prior work. The fifth enhancement involved the development of a standalone utility and was conducted as a parallel effort to the other four.

Each of the development efforts consisted of four activities collectively identified in the slide by the word PERFORM. PERFORM includes the activities of: developing the program design, coding of the design, testing of the code, and documentation of the enhancement. The documentation took the form of updates to the existing model documentation³⁻⁶ prepared on the M10 Dates Study.

An overall test of the model demonstrating operation of the enhancements including the utility program, completed the development process.

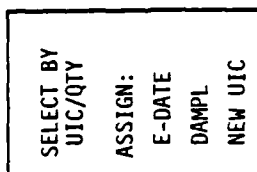
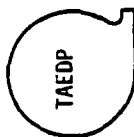


METHODOLOGY - UNPROGRAMED UNITS

OBJECTIVE: BUILD ADDITIONAL UNPROGRAMED UNITS USING ASSETS CURRENTLY ASSIGNED TO PROGRAMED UNITS.

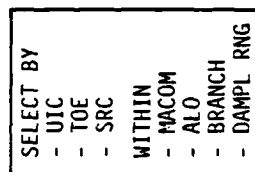
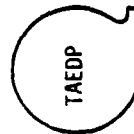
STEP I

CREATE UNPROGRAMED UNITS USING CURRENTLY PROGRAMED UNITS AS PROTOTYPES.



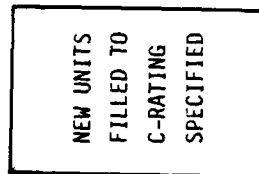
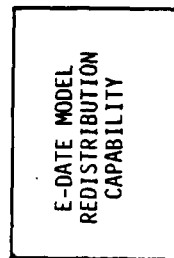
STEP II

IDENTIFY SOURCES OF ASSETS AMONG PROGRAMED UNITS (BILLPAYERS).



STEP III

REDISTRIBUTE ASSETS FROM BILLPAYERS TO UNPROGRAMED UNITS.



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METHODOLOGY - UNPROGRAMMED UNITS

The unprogrammed unit enhancement allows the creation of new units using assets currently assigned to existing (programmed) units. The methodology for the unprogrammed units proceeds in three steps.

Step I - The new units are created using existing unit TOEs as prototypes. The prototype TOEs are identified by the user using the existing unit identification code (UIC). The user assigns to each created unit an activation date (E-DATE), a priority (DAMPL), a new UIC, and the number of these new units required. If more than one new unit is to be created, the new UIC is modified to have a sequential count included in the last two places of the UIC. The E-DATE value is the fiscal year (FY) (last two digits) in which the new unit is to be activated. This value controls the activation of the unit in the user specified fiscal year, regardless of the year in which the prototype unit was activated. The user specified DAMPL VALUE is provided for use in the third step of this process to control the redistribution of equipment among units (see Step III below).

Step II - The user identifies the sources of assets among existing units (billpayer units) to be tapped. The billpayer units may be identified by UIC, by table of organization and equipment (TOE), or standard requirement code (SRC). The selection of billpayers by SRC and TOE may be constrained to units within a particular major Army command (MACOM), authorized level of organization (ALO), branch of service (BR), or range of priority values (DAMPL RANGE).

Step III - Processing proceeds with the rating and redistribution occurring under the control of the user, as described earlier in Slide 3.

Given that the user has made a selection of billpayer units which are, in fact, able to supply the equipment needed by the new units, the redistribution will be successful in filling the new units to the C-rating specified by the user. If not successful, the user must either select different billpayer units or accept the shortfalls of the redistribution process.



METHODOLOGY - EQUIPMENT SUBSTITUTION

OBJECTIVE: INCLUDE SUBSTITUTE ITEMS OF EQUIPMENT, AS
IDENTIFIED IN TAEDP, IN LINE ITEM NO (LIN)
RATING

$$\text{LIN RATING} = \frac{\sum \text{TOE LIN ASSETS} + \sum \text{SUBS LIN ASSETS}}{\sum \text{TOE LIN REQUIRED}}$$

7

METHODOLOGY - EQUIPMENT SUBSTITUTION

The equipment substitution enhancement allows for the inclusion of substitute items of equipment in the computation of unit readiness. Substitute items are those items considered to be the functional equivalents of the required equipments but which are not physically identical to the required equipment.

The methodology for including the substitute items of equipment is one of adding the quantity of the (one or more) substitute items to the quantity of the authorized item in carrying out the computation of the item rating, as shown in the numerator of the summation expression in the slide. In the earlier E-DATE Model, the second term in the numerator was not present in the computation.

This procedure has not been possible in the past because the substitute items of equipment, while present in the TAEDP data, were not identified as such. It was not possible, therefore, to correlate the substitute with the authorized item for computation purposes.

The more complicated issue, however, is handling the substitute items during redistribution, as presented in the next slide.



CONSTRAINTS - SUBSTITUTION REDISTRIBUTION

- UNIT-BY-UNIT DEFINITION OF SUBSTITUTE ITEMS.
- INCOMPLETE LIST OF UNIT-BY-UNIT SUBSTITUTES.
- COMPATIBILITY WITH EXISTING E-DATE REDISTRIBUTION METHODOLOGY.

CONSTRAINTS - SUBSTITUTION REDISTRIBUTION

At the present time, the Army equipment substitution practice allows individual units the final say on whether to accept a particular authorized substitute, at the time the requisition is to be filled. There are two ramifications of this practice which must be taken into account for the enhanced E-DATE Model. First, the substitutes must be treated as unique on a unit-by-unit basis. Second, since the unit preference is only made known at the time of a requisition, the preference is only generated if a substitute was actually offered. If the authorized equipment was available to the unit, no substitution issue arose to become a matter of record. As a consequence, the unit-by-unit substitution information on hand (in TAEDP) is incomplete, in that a substitute preference is not expressed for every item.

Additionally, there is the need to achieve compatibility with the existing E-DATE redistribution methodology. This methodology provides for a single value for the equipment assets. If a substitute item is present, it is accumulated into the equipment total (just as in the case where different national stock numbers, with the same line item number (LIN), are accumulated) to generate the total assets present for a particular LIN. Individual book-keeping is not provided for the constituent LINS making up the overall quantity.




Given this single value, it is necessary to keep track of the various LIN which comprise it, when either passing the item to another unit or receiving the item from another unit. This is accomplished by renaming the LIN to include the identity on the other LIN present. The simplest nomenclature is a composite name which incorporates the constituent LIN. For design purposes, the total number of LIN is limited to the authorized LIN and a maximum of two substitute LIN. Since each LIN is 6 characters in length, the new LIN, now referred to as a LIN-SET, is up to 18 characters in length. Each LIN present in the unit is put into LIN-SET format, with blank fields where substitutes are absent.

The methodology for carrying out the substitution using the LIN-SET construct is described on the following slide.



METHODOLOGY - SUBSTITUTION REDISTRIBUTION

OBJECTIVE: REDISTRIBUTE SUBSTITUTE ITEMS OF EQUIPMENT SUBJECT TO LIN-SET DISTRIBUTION CASES

DISTRIBUTION CASE	BILLPAYER LIN-SET CASES	DISTRIBUTE TO	A	B	C	SHORTAGE LIN-SET RANK																
I	<table><tr><td>LIN</td><td>--</td></tr><tr><td>--</td><td>--</td></tr></table>	LIN	--	--	--		<table><tr><td>LIN</td><td>--</td></tr><tr><td>--</td><td>--</td></tr></table>	LIN	--	--	--	<table><tr><td>LIN</td><td>--</td></tr><tr><td>SBI</td><td>--</td></tr></table>	LIN	--	SBI	--	<table><tr><td>LIN</td><td>SBI</td></tr><tr><td>SBI</td><td>SB2</td></tr></table>	LIN	SBI	SBI	SB2	
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LIN	SB2																					
SBI	SB2																					
LIN	SBI																					
SBI	SB2																					

9

METHODOLOGY - SUBSTITUTION REDISTRIBUTION

Redistribution is the movement of assets from one (billpayer) unit to another (shortage) unit. Provision must be made to move the assets, taking into account the members which make up the LIN-SET. The basic transfer constraint is that no billpayer LIN-SET can be distributed to a LIN-SET which does not contain all the members in the LIN-SET. For example, if a LIN-SET consists of 5T truck and a 10T truck as a substitute item, then this LIN-SET can only be transferred to LIN-SET where this combination is present. It is important to note that it is the combination of LINS (authorized and substitute) which is defined by the LIN-SET, not the quantity of each LIN present. In the two-truck LIN-SET example, if the shortage LIN-SET calls for an additional 10 items, then any billpayer LIN-SET comprised of the same trucks can satisfy the requirement, regardless of the constituent quantities of the LINS involved.

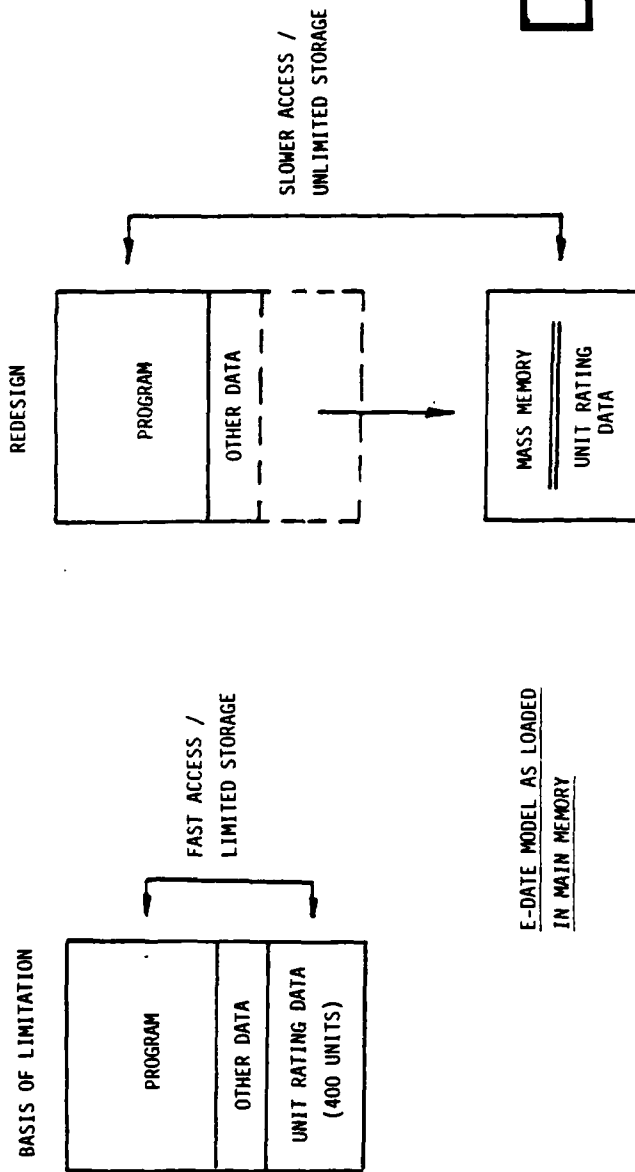
Generalizing this example results in the cases shown in the slide. In Case I, a single LIN may be transferred to any other LIN-SET which includes it as a primary or substitute LIN. In Case II, the transfer may be made to any LIN-SET that contains both the primary and the substitute LINS in the billpayer LIN-SET. In Case III, the transfer involves matched LIN-SETs and no subset issue is involved.

The enhanced model matches acceptable transfers by case and, within case, by LIN-SET ranking, as shown on the slide. For example, in Case I, the billpayer LIN-SET consists of one LIN. Since it may satisfy more than one LIN-SET, transfer to the most exclusive LIN-SET is attempted first. That is, a matched situation ranks over a subset situation. This ranking is indicated as A, B, C on the slide. For Case II, the transfer is first attempted to the matching case (one substitute) and then to a LIN-SET with two substitutes. For Case III, the transfer can only be made to the matching LIN-SET, since no others are available.



METHODOLOGY - ELIMINATE 400-UNIT LIMITATION

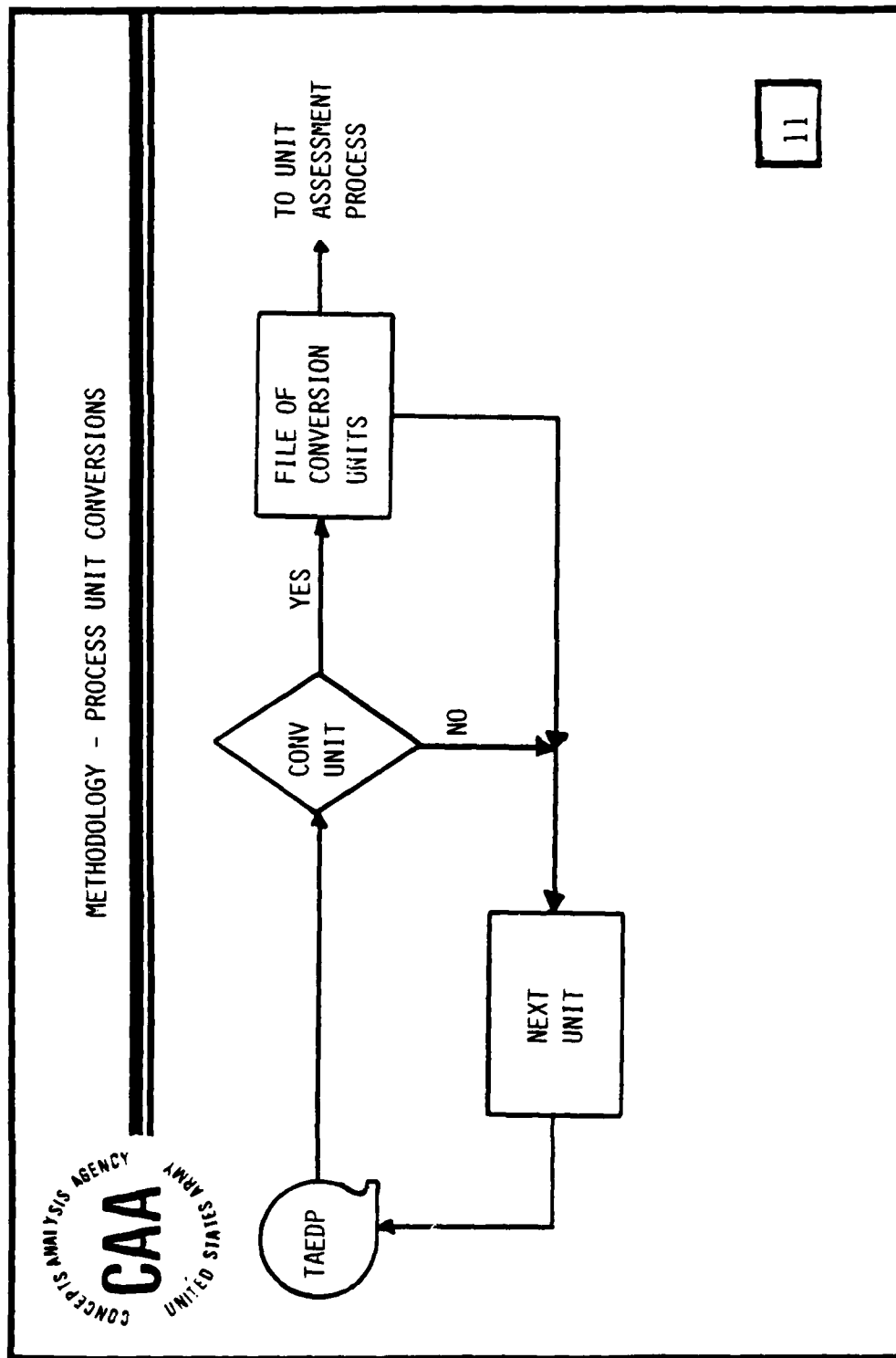
OBJECTIVE: MAKE PROVISION FOR PROCESSING AN UNLIMITED NUMBER OF UNITS.



METHODOLOGY - ELIMINATE 400-UNIT LIMITATION

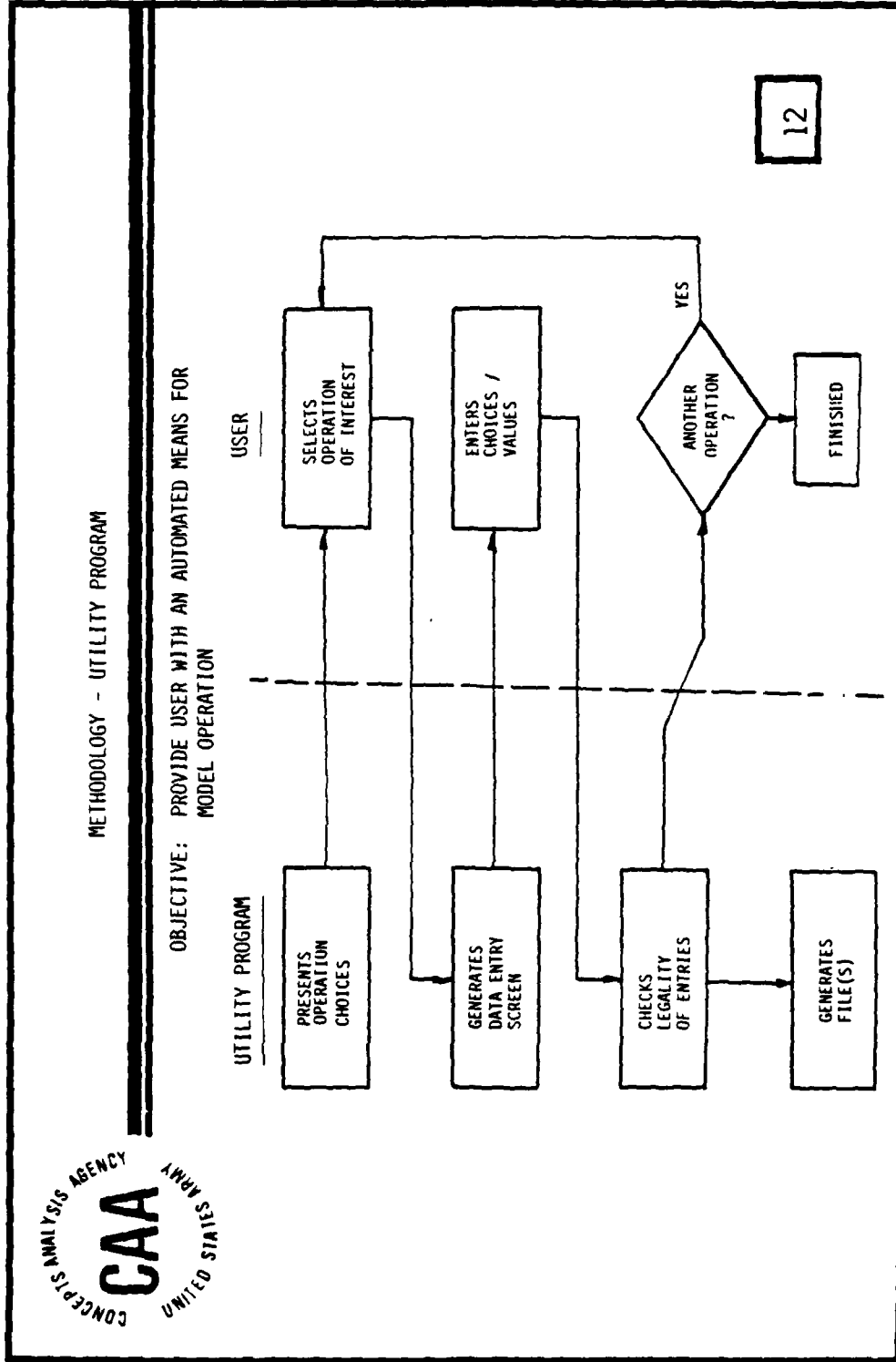
This enhancement eliminates the 400-unit limitation, thereby making provision for processing an unlimited number of units. The earlier E-DATE Model held unit rating results in main memory along with other processing results. However, the large number of units involved in the processing of the units affected by the MTOE changes (see Slide 1) could not be accommodated without using excessive memory.

The enhanced model moves the storage of the rating results from main memory to disk, where an effectively unlimited number of units can be stored. The only penalty is a somewhat slower access time to the rating results due to increased time for disk versus main memory access. This access, however, is only needed once per unit to store the rating results and once per unit to display the rating results. It is not a critical time utilization consideration.



METHODOLOGY - PROCESS UNIT CONVERSIONS

This enhancement allows the E-DATE Model to select and process units shown as conversions in the model data source (TAEDP). The converted units are sensed in the data by testing whether or not the ACTION CODE field of the unit data records are set to the letter C. If so set, the data records associated with the unit are passed to an output file. After all the converted units have been identified, the data is passed, under user control, to the existing model unit assessment process, where it is handled in a manner identical to that of the other groups of units (i.e., activations, CTU impacted units, and unprogramed units).



METHODOLOGY - UTILITY PROGRAM

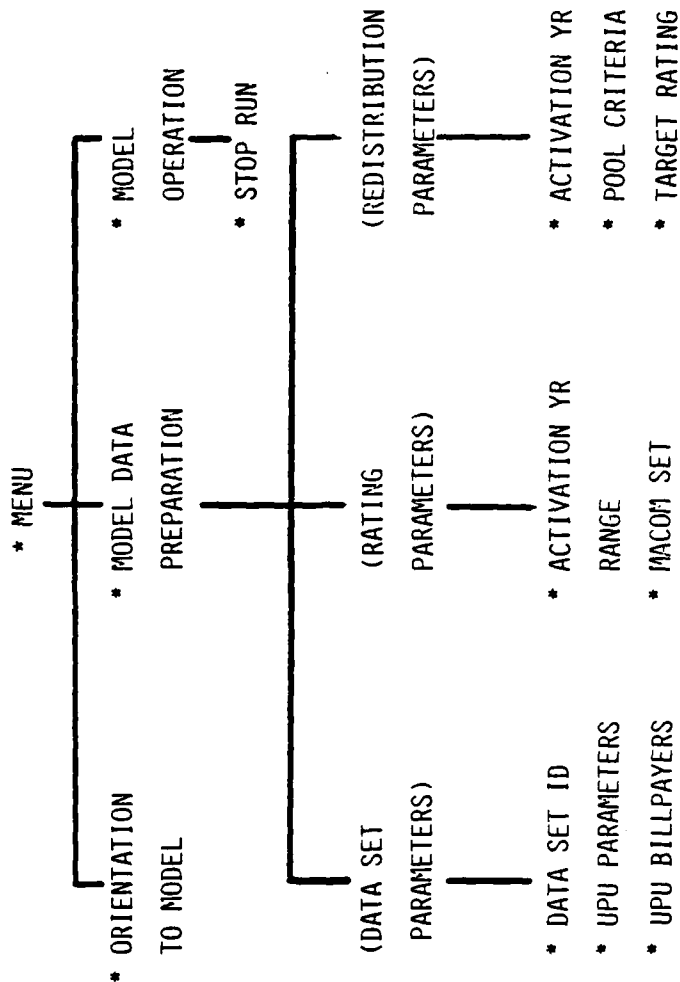
The utility program enhancement provides the user with an automated means for operation of the model. Operation includes preparation of the necessary inputs to control the model and the actual start and (if needed) stop of the model execution.

The utility program leads the user through the steps needed to prepare the model for operation and allows the user to start and stop the model, all with only a minimal familiarity with computer system operating procedures. The utility presents the user with a series of choices as to the task to be performed. The user indicates the task of interest, and the utility responds with a screen soliciting values appropriate to the task. The user enters these values, and the utility performs basic validity checks. If errors are encountered, the user is prompted for a corrected input. Otherwise, the utility moves on to solicit another task until all the necessary inputs are prepared or the user indicates the session is to be terminated.

The following slide describes the organization and content of the screens generated by the utility.



UTILITY PROGRAM SCREENS



UPU - UNPROGRAMMED UNIT

UTILITY PROGRAM SCREENS

The utility program generates a set of 13 screens, each of which is identified on the slide with an asterisk. The MENU screen is used to direct the user to one of three groups of screens.

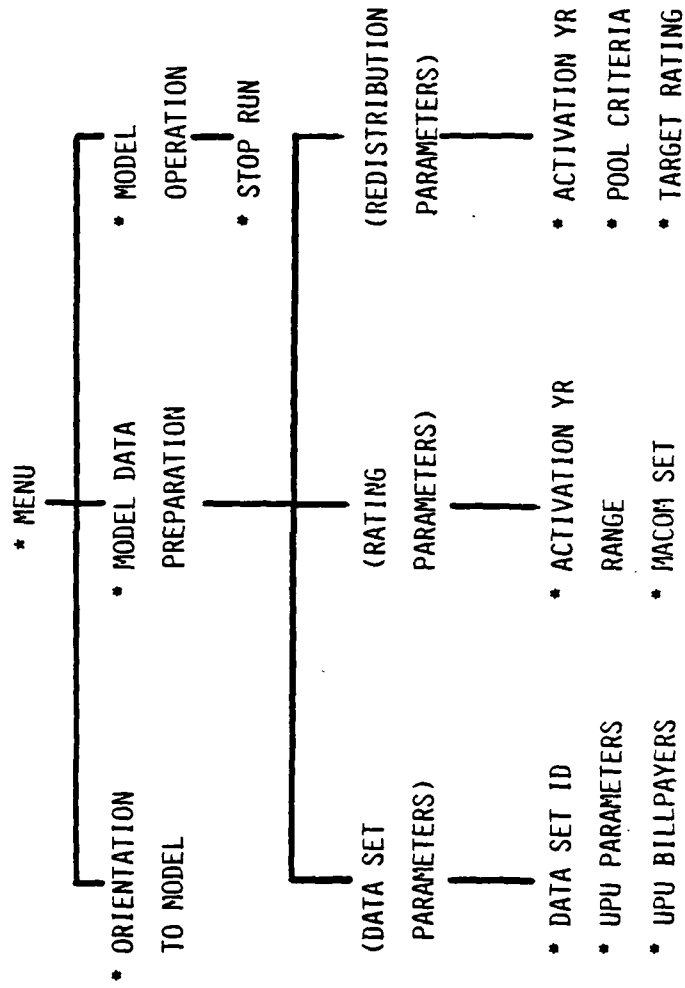
Within these three groups, other screens may be called up by the user. As shown in the slide, the MODEL DATA PREPARATION group is the most elaborate of the three screen groups. It allows for the entering the data set of interest on the DATA SET ID screen. Any or all of these data set IDs may be selected by the user. Supplementing the data set ID screen are two other screens. One (UPU PARAMETERS) allows the user to identify the parameters to be used in creating unprogramed units. The other (UPU BILLPAYERS) allows the user to identify the units from which equipment may be transferred to the new units.

The RATING PARAMETER screens allow the user to select the part of a data set to be rated. The ACTIVATION YR RANGE screen allows the user to focus upon specific years in which to consider unit activations. The MACOM SET screen allows the user to identify the particular MACOMs which are of interest in examining the impact of MTOE changes on unit ratings, including the case of all MACOMs.

The ACTIVATION YR screen allows the user to select the units corresponding to a particular activation year to be subject to redistribution. The MACOM screen allows the user to select only the units from a particular MACOM to be selected for redistribution. The POOL CRITERIA screen allows the user to select the parameters which will control which units are selected for uprate to a higher C-level of readiness and which are candidates for downrate to a lower C-level. The TARGET RATING screen allows the user to select the C-ratings to be associated with a particular uprated and downrated unit.



UTILITY PROGRAM SCREENS



UPU - UNPROGRAMMED UNIT

UTILITY PROGRAM SCREENS (cont)

Two other groups of screens are available to the user. The ORIENTATION TO MODEL screen provides to user with a multiscreen summary of model operation. The MODEL OPERATION screen allows the user to start the model operation. As part of the processing of this screen, the utility checks that the files involved in the run are present on the system and contain entries. The STOP RUN screen provides the user with the job number for the run to be terminated and the AUTOVON number of the computer operator at LEA who must be contacted to take the action to kill the run.

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SECTION III - STUDY SUMMARY

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STUDY SUMMARY

E-DATE MODEL NOW HAS THE UPGRADED CAPABILITY TO:

- INTRODUCE UNPROGRAMED UNITS INTO FORCE IN FY DESIRED, USING ASSETS CURRENTLY PROGRAMED FOR THAT FY.
- INCLUDE TAEDP IDENTIFIED EQUIPMENT SUBSTITUTIONS IN COMPUTATION OF UNIT READINESS.
- PROCESS UNITS WITH NO EFFECTIVE LIMIT ON NUMBER.
- PROCESS UNITS PROGRAMED FOR CONVERSION.
- INTERFACE READILY WITH USER.

STUDY SUMMARY

The study has implemented the tasked enhancements to the E-DATE Model and has upgraded the capability of the model as shown in the slide. In addition, updates have been prepared to the four-volume set of model documentation. The updates will be incorporated into the individual volumes by LEA using the LEA word processing facility and diskette copies of each volume of documentation, originally provided on the MTO Dates Study.

APPENDIX A
STUDY CONTRIBUTORS

1. STUDY TEAM

a. Study Team

Mr. James J. Connelly, Study Director, Force Systems Directorate
Mr. Walter Aldridge, Analysis Support Directorate
Ms Merle Lehman, Analysis Support Directorate
Mr. Clifford Johnson, Analysis Support Directorate

b. Team Contributors

Ms Danielle Bernstein (Summer Hire)

c. Other Contributors

Ms Beverly Knox, Analysis Support Directorate

2. PRODUCT REVIEW BOARD

Dr. Robert L. Helmbold, Chairman
MAJ Joseph S. Rovanseck
Ms Marcia K. Clark

3. EXTERNAL CONTRIBUTORS

a. Office, Deputy Chief of Staff for Logistics

BG James M. Hesson
COL Emery W. Hampton
COL Lynn I. Caraway
COL Herman C. Kammer, Jr.
COL Forest P. Norrod
Mr. Clarence W. Herrell, Jr.
Mr. Charles K. Hall

b. Logistics Evaluation Agency (LEA)

COL J. Glasker
Mr. V. R. Adkins
Mr. J. H. Stauffer
Mr. Frank Foss
Ms Janice Levine

APPENDIX B
STUDY DIRECTIVE

NOTE: The original name of the
Equipment Readiness Analysis (ERA)
Study was subsequently changed to
E-DATE Model Enhancement (EME) Study.



DEPARTMENT OF THE ARMY
OFFICE OF THE DEPUTY CHIEF OF STAFF FOR LOGISTICS
WASHINGTON, D.C. 20310

REPLY TO
ATTENTION OF

9 SEP 1983

DALO-PLF

SUBJECT: Equipment Readiness Analysis (ERA) Study

Director
U. S. Army Concepts Analysis Agency
8120 Woodmont Avenue
Bethesda, Maryland 20814

1. PURPOSE. This directive provides for the establishment of a study group to conduct subject study.
2. STUDY TITLE. Equipment Readiness Analysis (ERA) Study.
3. BACKGROUND. This study is a follow-on to a computer model development effort accomplished for the Director of Plans and Operations, ODCSLOG, under the study title, Management of MTOE Effective Dates Based on Equipment Availability (MTO DATES). The model developed, the Effective Date (E-DATE) Model, was installed at the U. S. Army Logistics Evaluation Agency (LEA) and is operational from a remote terminal facility installed within the ODCSLOG work area. The E-DATE Model is used to assess the logistical impact of unit activations and MTOE changes and to predict the most appropriate effective dates for those actions over the seven years covered by the Total Army Equipment Distribution Program (TAEDP) data base. As presently configured, the model addresses only programed force structure activations and changes; i.e., programed in the Structure and Composition System (SACS) file that is used to generate TAEDP. A capability to examine unprogramed changes is also required. In addition, ODCSLOG needs the capability to consider substitute items of equipment during the assessment process. To facilitate ODCSLOG's use of the model in analyzing these issues, the current limit of 400 units that can be examined at one time needs to be lifted and a user-friendly utility program needs to be developed.
4. DA STAFF PROPONENT. Office of the Deputy Chief of Staff for Logistics (DA, ODCSLOG).
5. STUDY AGENCY. U. S. Army Concepts Analysis Agency (CAA).
6. TERMS OF REFERENCE:
 - a. Problem. AR 310-49 and CSR 310-44 require the DCSLOG to advise the DCSOPS regarding the supportability of unit activations and MTOE changes based on availability of equipment assets. The volume of changes dictates the need for an automated methodology to predict the most appropriate effective date

DALO-PLF

SUBJECT: Equipment Readiness Analysis (ERA) Study

for those changes. The E-DATE Model developed by CAA during the MTO DATES Study addresses programed changes, but is not currently configured to address unprogramed changes. In addition, the model currently does not provide for equipment item substitution during assessment of available assets.

b. Purpose.

(1) To develop an enhancement to the E-DATE Model that will permit assessment of equipment availability to meet requirements of unprogramed force structure actions and install it at LEA.

(2) To develop an enhancement to the E-DATE Model that will provide for line item number (LIN) substitution during assessment of available assets and install it at LEA.

c. Objectives.

(1) To develop and install at LEA an E-DATE Model enhancement to address unprogramed force structure changes.

(2) To develop and install at LEA an E-DATE Model enhancement to permit equipment item substitution.

(3) To develop a computer utility program to assist ODCSLOG personnel in exercising the E-DATE Model in its various modes of operation.

(4) To eliminate the current limitation of 400 units that can be processed by the E-DATE Model.

d. Study Scope. Modify, as necessary, those programs and subroutines currently contained within the E-DATE Model to be consistent with:

(1) The unprogramed unit activation enhancement and item substitution enhancement, and the computer utility program to be developed in this study.

(2) A SACS action code that will be added to the TAEDP data base to distinguish between proposed unit activations and unit conversions. The action code is to be added by the Depot Systems Command (DESCOM), proponent for TAEDP.

(3) An additional data record to be added to TAEDP by DESCOM to identify approved substitute items of equipment.

(4) The elimination of the current limitation of 400 units that can be processed by the E-DATE Model at one time.

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SUBJECT: Equipment Readiness Analysis (ERA) Study

e. Limitations.

(1) The E-DATE Model developed during the MTO DATES Study, and installed at LEA, processes TAEDP data produced by DESCOM. The reliability of output from the model will be commensurate with the TAEDP data extract tape.

(2) The unprogramed unit activation enhancement will require specific guidance from ODCSLOG with respect to the appropriate sources for equipment required to organize each unprogramed unit since unprogramed units are not contained in SACS and, therefore, are not included in the TAEDP data base. ODCSLOG guidance will be provided NLT 1 October 1983.

(3) Assistance to be provided by CAA concerning data input preparation and model operation will be limited to technical guidance and consultation. Data collection, TAEDP data base development and production use of the model will be provided by ODCSLOG.

(4) Orientation of ODCSLOG personnel by CAA with respect to model operation will be limited to the new enhancements and the utility program to be developed in this study.

(5) Model documentation provided by CAA for the two enhancements will be similar in format, scope, and level of detail to that provided by CAA as draft documentation for the E-DATE Model developed in the MTO DATES Study. Changes to format, scope, or level of detail will be accomplished by ODCSLOG.

(6) The item substitution enhancement will conform to substitute LIN identified in TAEDP.

(7) The unprogramed unit activation enhancement will draw equipment requirements either from designated sources already in TAEDP or from units constructed by the model user as input. Interface with other data systems will not be provided.

f. Timeframe. Current.

g. Assumptions.

(1) DESCOM will integrate into the TAEDP data extract tape:

(a) The SACS action code to distinguish between proposed unit activations and unit conversions.

(b) Data record(s), accessible by the E-DATE Model, to identify specific LIN for substitute equipment.

(2) ODCSLOG will make specific guidance concerning equipment sources for unprogramed unit activations available to CAA NLT 1 October 1983.

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SUBJECT: Equipment Readiness Analysis (ERA) Study

7. RESPONSIBILITIES. The DA Staff proponent agency will:

a. Update and provide to LEA a data file on pacing and aircraft item data in SRC sequence.

b. Assure that authoritative support and coordination are made available to the study from:

(1) Depot Systems Command. To provide TAEDP extract tapes for normal distribution to LEA.

(2) Logistics Evaluation Agency. To augment the TAEDP extract tapes with pacing and aircraft item information.

8. REFERENCES.

a. Total Army Equipment Distribution Program.

b. Management of MTOE Effective Dates (MTO DATES I and II) Study.

c. AR 5-5, The Army Study System.

9. ADMINISTRATION.

a. Support.

(1) Funds. Funds required for TDY, per diem, overtime, etc., are the responsibility of each study participant.

(2) Milestone Schedule. See enclosure 1.

b. Control Procedures. The proponent agency will act as the principal coordinator between elements of the DA Staff and the study agency. Direct coordination is authorized between CAA, LEA, and DESCOM.

c. Coordination. This tasking directive has been coordinated with CAA in accordance with paragraph 3, AR 10-38.

d. Evaluation. Study proponent will prepare a written evaluation of study results in accordance with AR 5-5.

FOR THE DEPUTY CHIEF OF STAFF FOR LOGISTICS:

Encl

For [Signature] 10/24/84, 65
HERMAN C. KAMMER, JR.
Colonel, GS
Acting Director of Plans
and Operations

MILESTONE SCHEDULE

Develop and coordinate tasking directive	15 Sep 83
Eliminate 400-unit limitation	15 Oct 83
Monitor contract for E-DATE Model documentation	30 Oct 83
Develop item substitution enhancement	31 Dec 83
Develop unprogramed unit activation enhancement	15 Mar 84
Develop computer utility program	31 Mar 84
Update documentation	31 Mar 84
Complete final report	30 Apr 84



DEPARTMENT OF THE ARMY
OFFICE OF THE DEPUTY CHIEF OF STAFF FOR LOGISTICS
WASHINGTON, D.C. 20310

DALO-PLF

7 JUN 1984

SUBJECT: Effective Date (E-DATE) Model Enhancement (EME) Study Amendment

Director
U. S. Army Concepts Analysis Agency
ATTN: CSCA-FSL
8120 Woodmont Avenue
Bethesda, Maryland 20814

1. Reference:

a. Letter, HQDA (DALO-PLF), dated 9 September 1983, subject: Equipment Readiness Analysis (ERA) Study, subsequently named the Effective Date (E-DATE) Model Enhancement (EME) Study (Encl 1).

b. Telephone conversation between Mr. James Connelly (CSCA-FSL) and Mr. Charles Hall (DALO-PLF), 4 June 1984, subject as above.

2. A requirement exists to modify the Effective Date (E-DATE) Model Enhancement (EME) Study to incorporate a feature that will allow the program to select and provide status on units scheduled for conversion in any of the years covered by the Total Army Equipment Distribution Program (TAEDP).

3. This new requirement was generated as a result of the Documentation Modernization (DOCMOD) initiative that requires the ODCSLOG to objectively analyze proposed force structure changes in the near term (FY85-FY86) force. The readiness changes for both unit activations and conversions are necessary to complete the analysis by the suspense date imposed by DOCMOD.

4. It is envisioned that this modification will be accomplished in three steps:

a. Modify the current coding to allow the program to select those units that are shown as conversions on the TAEDP file. This added feature should be incorporated into the EME model to allow processing by 20 June 1984.

b. Modification of the utility program to allow for future use of this sub-routine.

c. Update of the documentation to incorporate this sub-routine.

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SUBJECT: Effective Date (E-DATE) Model Enhancement (EME) Study Amendment

5. The milestone schedule shown at enclosure 1, reference paragraph 1a above, is amended by adding:

Develop unit conversion enhancement	20 Jun 84
Update utility program	31 Jul 84
Update documentation	31 Aug 84

FOR THE DEPUTY CHIEF OF STAFF FOR LOGISTICS:

SIGNED

1 Encl

J. E. ROZIER
Brigadier General, GS
Director of Plans and Operations

CF:
CDR USALEA
DALO-SMD

APPENDIX C
REFERENCES

DEPARTMENT OF THE ARMY

Headquarters, Department of the Army

1. AR 220-1, Unit Status Reporting, June 1981

US Army Concepts Analysis Agency

2. Management of MTOE Effective Dates Based on Equipment Availability (MTO Dates), CAA-SR-83-3, July 1983
3. Effective Date (E-DATE) Model Documentation, Volume I - Functional Description, CAA-D-83-3, October 1983
4. Effective Date (E-DATE) Model Documentation, Volume II - User's Manual, CAA-D-83-3, October 1983
5. Effective Date (E-DATE) Model Documentation, Volume III - Computer Operation Manual, CAA-D-83-3, October 1983
6. Effective Date (E-DATE) Model Documentation, Volume IV - Program Maintenance Manual, CAA-D-83-3, October 1983

Headquarters, US Army Depot Systems Command

7. Total Army Equipment Distribution Program (TAEDP) User's Guide, DESCOM Pamphlet No. 700-1, 2 May 1983

APPENDIX D
DISTRIBUTION

Addressee	No of copies
Deputy Chief of Staff for Logistics Headquarters, Department of the Army ATTN: DALO-PLF Washington, DC 20310	5
Commander US Army Logistics Evaluation Agency ATTN: DALO-LED New Cumberland Army Depot New Cumberland, PA 17070	5
Director Defense Logistics Studies Information Exchange US Army Logistics Management Center Fort Lee, VA 23801	1
Defense Technical Information Center ATTN: DTIC-DDA Cameron Station Alexandria, VA 22314	2
The Pentagon Library (Army Studies Section) ATTN: ANRAL-RS The Pentagon Washington, DC 20310	1

GLOSSARY

ALO	authorized level of organization
BR	branch of service
CAA	US Army Concepts Analysis Agency
CTU	Consolidated Table of Organization Update
CSR	Chief of Staff Regulation
DA	Department of the Army
DAMPL	Department of the Army Master Priority List
DESCOM	Depot Systems Command
E-DATE	effective date
E-DATE Model	Effective Date Model
ERC	equipment readiness code
LEA	Logistics Evaluation Agency
LIN	line item number
MACOM	major Army command
MTO Dates	Management of MTOE Effective Dates Based on Equipment Availability (study)
MTOE	Modification Table(s) of Organization and Equipment
ODCSLOG	Office of the Deputy Chief of Staff for Logistics
ODCSOPS	Office of the Deputy Chief of Staff for Operations and Plans
SRC	standard requirement code
T	ton
TAEDP	Total Army Equipment Distribution Program
TOE	table(s) of organization and equipment
UIC	unit identification code
UPU	unprogramed units



**EFFECTIVE DATE (E-DATE) MODEL
ENHANCEMENT
(EME)**

**ONE SHEET
STUDY GIST
CAA-SR-84-17**

THE PRINCIPAL FINDINGS are that the enhanced E-DATE Model now has the capability to:

- (1) Introduce unprogramed units into the force, in the fiscal year (FY) desired.
- (2) Include equipment substitutions identified by the Total Army Equipment Distribution Program (TAEDP) in the computation of unit readiness.
- (3) Process units with no effective limit on the number involved.
- (4) Process units programed for conversion.
- (5) Interface readily with the user.

THE MAIN ASSUMPTIONS were that the TAEDP can be used as a source of table of organization and equipment (TOE) data for the unprogramed units. That is, that the TOEs are present in the data and that the required quantities of each item of equipment are complete and accurate.

THE PRINCIPAL LIMITATIONS are:

- (1) Prototype units are extracted as they are found in TAEDP with no provision for additions, deletions, or adjustment of the TOE values.
- (2) The number of substitute items of equipment associated with an authorized item is limited to the first two encountered. Any additional substitutes which may be present are not processed.

THE SCOPE OF THE STUDY was limited to the five specifically identified enhancements.

THE STUDY OBJECTIVES were:

- (1) Develop an unprogramed unit enhancement.
- (2) Develop an equipment substitution enhancement.

(3) Eliminate the current 400-unit limitation on the number of units which can be rated in a fiscal year.

(4) Process units shown as conversions in TAEDP data.

(5) Develop a user-friendly computer utility program to facilitate use of the model.

THE BASIC APPROACH was tailored to the needs of each enhancement. The unprogramed units enhancement required additional logic to extract the data from the TAEDP tape per the user specifications. The equipment substitution required additional logic to group the LIN and its substitutes into a LIN-SET and to then process this LIN-SET through rating and redistribution. The 400-unit limitation required logic to pass the rating data to mass storage and later retrieve it for display purposes.

THE REASONS FOR PERFORMING THE STUDY were to extend the E-DATE Model capability into areas of interest identified during the original and early operation of the model.

THE STUDY SPONSOR was the Director, Plans and Operations, Office of the Deputy Chief of Staff for Logistics (ODCSLOG).

THE STUDY EFFORT was directed by Mr. James J. Connelly, Force Systems Directorate.

COMMENTS AND QUESTIONS may be directed to US Army Concepts Analysis Agency, ATTN: Assistant Director for Force Systems (CSCA-FS), 8120 Woodmont Avenue, Bethesda, Maryland 20814-2797.



**EFFECTIVE DATE (E-DATE) MODEL
ENHANCEMENT
(EME)**

**ONE SHEET
STUDY GIST
CAA-SR-84-17**

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	EFFECTIVE DATE (E-DATE) MODEL ENHANCEMENT (EME)	ONE SHEET STUDY GIST CAA-SR-84-17
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**EFFECTIVE DATE (E-DATE) MODEL
ENHANCEMENT
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**ONE SHEET
STUDY GIST
CAA-SR-84-17**

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- (2) Develop an equipment substitution enhancement.

(3) Eliminate the current 400-unit limitation on the number of units which can be rated in a fiscal year.

(4) Process units shown as conversions in TAEDP data.

(5) Develop a user-friendly computer utility program to facilitate use of the model.

THE BASIC APPROACH was tailored to the needs of each enhancement. The unprogramed units enhancement required additional logic to extract the data from the TAEDP tape per the user specifications. The equipment substitution required additional logic to group the LIN and its substitutes into a LIN-SET and to then process this LIN-SET through rating and redistribution. The 400-unit limitation required logic to pass the rating data to mass storage and later retrieve it for display purposes.

THE REASONS FOR PERFORMING THE STUDY were to extend the E-DATE Model capability into areas of interest identified during the original and early operation of the model.

THE STUDY SPONSOR was the Director, Plans and Operations, Office of the Deputy Chief of Staff for Logistics (ODCSLOG).

THE STUDY EFFORT was directed by Mr. James J. Connelly, Force Systems Directorate.

COMMENTS AND QUESTIONS may be directed to US Army Concepts Analysis Agency, ATTN: Assistant Director for Force Systems (CSCA-FS), 8120 Woodmont Avenue, Bethesda, Maryland 20814-2797.



**EFFECTIVE DATE (E-DATE) MODEL
ENHANCEMENT
(EME)**

**ONE SHEET
STUDY GIST
CAA-SR-84-17**

THE PRINCIPAL FINDINGS are that the enhanced E-DATE Model now has the capability to:

- (1) Introduce unprogramed units into the force, in the fiscal year (FY) desired.
- (2) Include equipment substitutions identified by the Total Army Equipment Distribution Program (TAEDP) in the computation of unit readiness.
- (3) Process units with no effective limit on the number involved.
- (4) Process units programed for conversion.
- (5) Interface readily with the user.

THE MAIN ASSUMPTIONS were that the TAEDP can be used as a source of table of organization and equipment (TOE) data for the unprogramed units. That is, that the TOEs are present in the data and that the required quantities of each item of equipment are complete and accurate.

THE PRINCIPAL LIMITATIONS are:

- (1) Prototype units are extracted as they are found in TAEDP with no provision for additions, deletions, or adjustment of the TOE values.
- (2) The number of substitute items of equipment associated with an authorized item is limited to the first two encountered. Any additional substitutes which may be present are not processed.

THE SCOPE OF THE STUDY was limited to the five specifically identified enhancements.

THE STUDY OBJECTIVES were:

- (1) Develop an unprogramed unit enhancement.
- (2) Develop an equipment substitution enhancement.

(3) Eliminate the current 400-unit limitation on the number of units which can be rated in a fiscal year.

(4) Process units shown as conversions in TAEDP data.

(5) Develop a user-friendly computer utility program to facilitate use of the model.


THE BASIC APPROACH was tailored to the needs of each enhancement. The unprogramed units enhancement required additional logic to extract the data from the TAEDP tape per the user specifications. The equipment substitution required additional logic to group the LIN and its substitutes into a LIN-SET and to then process this LIN-SET through rating and redistribution. The 400-unit limitation required logic to pass the rating data to mass storage and later retrieve it for display purposes.

THE REASONS FOR PERFORMING THE STUDY were to extend the E-DATE Model capability into areas of interest identified during the original and early operation of the model.

THE STUDY SPONSOR was the Director, Plans and Operations, Office of the Deputy Chief of Staff for Logistics (ODCSLOG).

THE STUDY EFFORT was directed by Mr. James J. Connelly, Force Systems Directorate.

COMMENTS AND QUESTIONS may be directed to US Army Concepts Analysis Agency, ATTN: Assistant Director for Force Systems (CSCA-FS), 8120 Woodmont Avenue, Bethesda, Maryland 20814-2797.

	<p align="center">EFFECTIVE DATE (E-DATE) MODEL ENHANCEMENT (EME)</p>	<p align="center">ONE SHEET STUDY GIST CAA-SR-84-17</p>
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THE PRINCIPAL FINDINGS are that the enhanced E-DATE Model now has the capability to:

- (1) Introduce unprogramed units into the force, in the fiscal year (FY) desired.
- (2) Include equipment substitutions identified by the Total Army Equipment Distribution Program (TAEDP) in the computation of unit readiness.
- (3) Process units with no effective limit on the number involved.
- (4) Process units programed for conversion.
- (5) Interface readily with the user.

THE MAIN ASSUMPTIONS were that the TAEDP can be used as a source of table of organization and equipment (TOE) data for the unprogramed units. That is, that the TOEs are present in the data and that the required quantities of each item of equipment are complete and accurate.

THE PRINCIPAL LIMITATIONS are:

- (1) Prototype units are extracted as they are found in TAEDP with no provision for additions, deletions, or adjustment of the TOE values.
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THE STUDY OBJECTIVES were:

- (1) Develop an unprogramed unit enhancement.
- (2) Develop an equipment substitution enhancement.

(3) Eliminate the current 400-unit limitation on the number of units which can be rated in a fiscal year.

(4) Process units shown as conversions in TAEDP data.

(5) Develop a user-friendly computer utility program to facilitate use of the model.

THE BASIC APPROACH was tailored to the needs of each enhancement. The unprogramed units enhancement required additional logic to extract the data from the TAEDP tape per the user specifications. The equipment substitution required additional logic to group the LIN and its substitutes into a LIN-SET and to then process this LIN-SET through rating and redistribution. The 400-unit limitation required logic to pass the rating data to mass storage and later retrieve it for display purposes.

THE REASONS FOR PERFORMING THE STUDY were to extend the E-DATE Model capability into areas of interest identified during the original and early operation of the model.

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